X-PLAIN™
Avian Influenza or Bird Flu
Reference Summary

Introduction

Avian influenza is an infection caused by avian influenza viruses. “Avian” means bird and “flu” is an abbreviation of influenza.

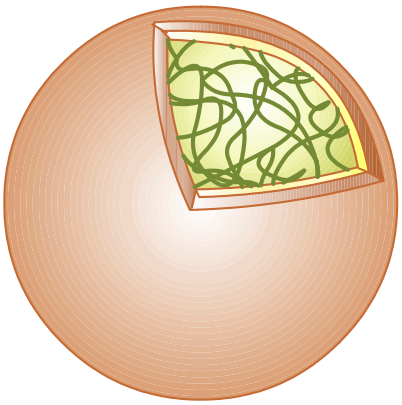
Avian flu can, in rare cases, be transmitted to humans. There is a real worry that avian flu has the potential to spread throughout the globe like wild fire resulting in thousands, if not potentially millions, of deaths.

This reference summary explains what avian flu is, what are its symptoms and treatment options. It also discusses its potential future threats and prevention.

Viruses

Viruses are very small living particles that are made of an outer shell that protects genetic material packaged in the inside.

Influenza Virus



In order for a virus to replicate itself it needs to enter another living cell by attaching itself to the living cell’s surface. To do so it uses complex and unique chemical compounds found on that cell’s surface. Because of the complexity of these chemicals, viruses tend to infect only specific cells in a specific species. For example, certain viruses may only attack human nerve cells and others can attack only bird intestinal cells.

Once inside the cell, the genetic material of the virus blends with the genetic material of the infected cell to replicate itself hundreds if not thousands of times.

The hundreds of replicated viruses then kill the cell, burst out of it, and infect hundreds if not thousands of new cells. The cycle repeats itself until the patient dies or unless the patient’s immune system destroys or keeps in check the invading viruses. The immune system is responsible for defending the body from foreign objects.

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During virus replication, the genetic material of the virus can undergo changes known as ‘mutations’. The virus can also exchange genetic material with the infected cell. These genetic changes can modify the chemicals on the surface of the virus. This in turn may make it possible for the virus to attack living cells of different species.

There are three types of influenza viruses, A, B or C. Types B and C are usually only found in humans and cause milder symptoms than type A, which can be found in both humans and animals such as birds, pigs, horses, whales and seals.

Avian Flu Viruses

The Avian influenza viruses occur naturally among birds. Wild birds worldwide may carry the viruses in their intestines, but usually do not get sick from them.

Avian influenza is very contagious among birds and can make some domesticated birds, such as chickens, ducks, and turkeys, very sick and kill them.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds.

Domesticated birds may become infected with avian influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with objects or food that have been contaminated with the virus.

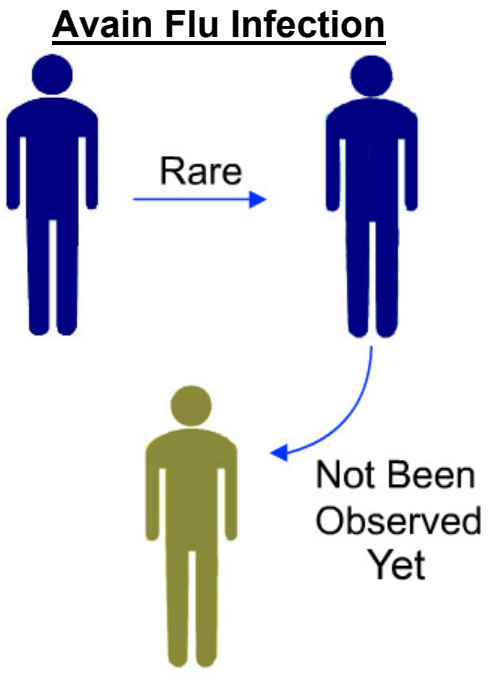
Infection with avian influenza viruses in domestic poultry can cause a mild disease or a severe one that can kill 90 to 100% of the flock within 2 days.

Human Infection

“Avian influenza virus” usually refers to influenza viruses found chiefly in birds, but infections with these viruses can occur in humans. The risk from avian influenza is generally low to most people, because the viruses do not usually infect humans.

Most cases of avian influenza infection in humans have resulted from contact with infected poultry such as domesticated chickens, ducks, and turkeys, or surfaces contaminated with secretion from infected birds. About 50% of infected people died from the infection.

Since 1997, there have been confirmed cases of human infection from several subtypes of avian influenza infection. There are more than 100 subtypes of avian flu viruses. Only 3 of these are known to infect humans.



The spread of avian influenza viruses from one ill person to another has been reported very rarely, and transmission has not been observed to continue beyond one person.

Influenza A viruses are constantly changing, and they might adapt over time to infect and spread among humans.

Symptoms

The time between infection of a person with the flu virus and the appearance of symptoms, the incubation period, can range from one to five days.

The symptoms of avian influenza vary in severity depending on which virus caused the infection. Symptoms of avian influenza in humans are similar to typical human influenza-like symptoms:

- Fever
- Cough
- Sore throat
- Muscle aches
- Eye infections

Pneumonia or severe lung infections and other severe respiratory diseases can occur. This could lead to life-threatening complications that may necessitate hospitalization and use of a respirator. If complications are not treated early, death is possible.

Treatment

Prescription medicines approved for human influenza viruses should work in treating avian influenza infection in humans. However, there are no known medications that treat an avian influenza infection specifically.

However, influenza viruses may become resistant to these drugs, so these medications may not always work. Additional studies are needed to demonstrate the effectiveness of these medicines on bird flu viruses.

Flu treatments that should work for avian flu include rest, medications to bring down high fevers, and drinking plenty of water.

If complications occur and the patient becomes very sick, then hospitalization may be necessary with administration of oxygen or the use of a respirator.

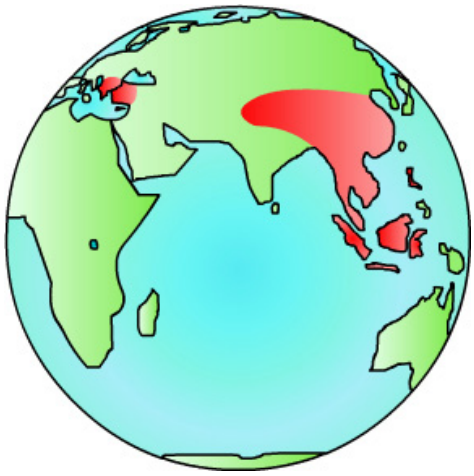
There currently is no commercially available vaccine to protect humans against the H5N1 virus , the avian flu virus found in Asia and Europe. However, vaccine development efforts are taking place. Research studies to test a vaccine to protect humans against H5N1 virus began in April 2005, and a series of clinical trials is under way.

Clinical Trials

Prevalence

As of January 2006, more than 130 human cases have been reported by the World Health Organization in Cambodia, China, Indonesia, Thailand, and Vietnam and recently in Turkey and Iraq. As time goes on, the list of human infections and countries will only get longer.

As of early 2006 most cases have occurred as a result of people having direct or close contact with infected poultry or contaminated surfaces; however, a few cases of human-to-human spread of H5N1 have occurred.



Outbreaks of avian influenza H5N1 occurred among poultry in eight countries in Asia: Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam during late 2003 and early 2004. In January 2006 children in Turkey have contracted and died from the avian flu. At that time, more than 100 million birds in the affected countries either died from the disease or were killed in order to try to control the outbreaks.

Since late June 2004, new outbreaks of influenza

H5N1 among poultry were reported by several countries in Asia: Cambodia, Chinese Tibet, Indonesia, Kazakhstan, Malaysia, Mongolia, Siberian Russia, Thailand, and Vietnam. Influenza H5N1 infection also has been reported among poultry in Turkey and Romania and among wild migratory birds in Croatia.

Future Risk

So far, the spread of H5N1 virus from person to person has been rare and has not continued beyond one person. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that the H5N1 virus could one day be able to infect humans and spread easily from one person to another.

Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If the H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic could begin. A pandemic is a worldwide outbreak of disease.

The World Health Organization has recognized 6 phases of Avian Flu spread, and has determined that we are currently in Phase 3, the pandemic alert period. The last phase, or Phase 6, is the pandemic phase.

- ***Phase 1:*** Risk of human infection is low and there is no new subtypes of influenza viruses in humans and no human-to-human spread.
- ***Phase 2:*** Risk of human infection is substantial but there is there is no new subtypes of influenza viruses in humans and no human-to-human spread.
- ***Phase 3:*** (Current Phase) Risk of human infection is substantial and there are new subtypes of influenza viruses in humans and rare instances of human-to-human spread.
- ***Phase 4:*** Risk of human infection is substantial and there are new subtypes of influenza viruses in humans and highly localized instances of human-to-human spread.
- ***Phase 5:*** Risk of human infection is substantial and there are new subtypes of influenza viruses in humans and localized large instances of human-to-human spread.
- ***Phase 6:*** This is the pandemic phase. Risk of human infection is substantial and there are new subtypes of influenza viruses in humans and sustained transmission of the virus in the general population.

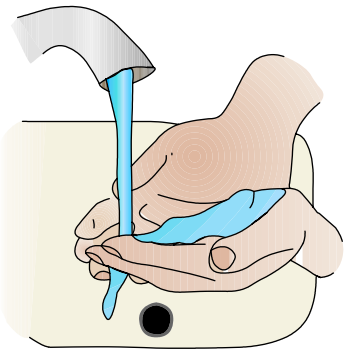
No one can predict when a pandemic might occur. However, experts from around the world are watching the H5N1 situation in Asia and Europe very closely and are

preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

A pandemic could result in the deaths of hundreds of thousands if not millions of people. It could easily overwhelm health care systems worldwide jeopardizing diagnosis and treatments of other diseases. It could also lead to severely reduced productivity and the loss of countless hours of work, devastating the worldwide economy.

Prevention Tips

The following tips will help you prevent flu infections such as the common flu and Avian flu:



- Wash your hands frequently with soap and water, particularly before eating and after sneezing or coughing.
- Use NIOSH-approved disposable masks rated N-95 or higher and that fit tightly over your nose and mouth.
- Cover your mouth and nose with tissue when you cough or sneeze. Put used tissues in a wastebasket. If you don't have a tissue, cough or sneeze into your upper sleeve.
- Stay at home if you are sick and stay away from others if they are sick.
- Eat only cooked meat and poultry.

Conclusion

Avian influenza or bird flu is an infection caused by avian influenza viruses. The virus is carried by wild birds and can devastate domestic birds if they get exposed to the virus.

So far, the spread of avian flu from birds to humans and from person to person has been rare. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that the bird flu virus could one day be able to infect humans and spread easily from one person to another.

No one can predict when a bird flu pandemic might occur. Experts from around the world are watching the spread of the bird flu viruses in Asia and Europe very closely.

They are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

For more information about Avian flu, check the website:

- PandemicFlu.gov